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Ainslie Dewe

Auckland University of Technology

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A New Era In Library And Information Collaboration In New Zealand

Ainslie Dewe

Auckland University of Technology
New Zealand

ABSTRACT:

The New Zealand government has signalled a new era for collaboration by establishing a Library and Information Advisory Commission (LIAC) under the National Library of New Zealand Act 2003. The statutory purpose of the Commission is to “provide advice to the Minister on library and information issues, including mātauranga Māori”. LIAC is required to take account of recent national and international developments in relation to library and information services. The promotion of collaboration in relation to protecting, preserving and promoting access to information is specifically listed as a key responsibility of LIAC.

LIAC is an independent advisor to government via the Minister for the National Library but is not restricted to National Library issues. The work of the Commission in highlighting the importance of library and information services to the wider cultural and economic life of the country is a unique opportunity to work across sectors and suggest a strategic framework for the development of the information society and the knowledge economy in New Zealand.

In this respect it will wish to work with LIANZA (Library and Information Association of New Zealand Aotearoa), which has already done considerable work in developing a national approach to information strategy. This is based on a three-pronged approach to knowledge:

- Knowledge Access – the infrastructure to access knowledge
- Knowledge Content – the content to be made available and accessible through an information infrastructure
- Knowledge Equity – the skills needed to turn information into knowledge.

As Chair of the Commission, the author of this paper contributes to LIAC a perspective of the importance of e-learning and e-research. Other members bring a wealth of experience from national, public and research library backgrounds and from education, ICT and the media. The work of the Commission in harnessing a wide range of expertise to provide an innovative model of collaboration is outlined.

KEYWORDS

Aotearoa, Collaboration, information, knowledge, Library, Māori, New Zealand, society

INTRODUCTION

Collaboration is generally agreed to be a worthy goal but successful implementation requires an understanding of the cultural change that may be

required. Hawkins [1] elaborates on distinctions made by Andrea Youngdahl, of the following three types of activity, which are often confused:

- **cooperative** behaviour that may be informal and superficial but where autonomy is retained
- **coordinated** activity that involves a greater level of mutual commitment and resource sharing
- **collaboration** that leads to a new community through a shared vision.

Collaboration is the most difficult to achieve and Hawkins suggests a number of reasons why it has had limited success in higher education.

“Higher education regularly backs away from collaborative relationships for a range of traditional reasons: institutional pride; the “not invented here” syndrome; the pursuit of control (no matter how illusory that concept has become!); the steadfast opinion that “my campus is unique; and the wistful desire for the way things used to be. Up until now, we have unfortunately approached collaboration as something we did (or should do) after we got done doing our primary business.” [1]

In some cases, collaboration can start to unravel when the significance of loss of autonomy is recognised. In others, the long-term benefits of collaboration are never seen as adequate compensation for the immediate change in behaviour that is required. Not surprisingly, it is those who have experienced the benefits of collaborative ventures who are the strongest advocates. However there is a risk that the evangelistic fervour of the advocates of collaboration could serve to alienate potential new recruits.

It is with an awareness of these challenges that the Library and Information Advisory Commission (LIAC) has begun its work, ‘promoting collaboration’ as part of its legislative function.

POLITICAL CLIMATE FOR COLLABORATION

After a number of years of being regarded as a social laboratory for de-regulated market economics, the public infrastructure of New Zealand is being encouraged by the government to adopt more collaborative approaches. The previous cultural position is not easily reversed but government agencies are explicitly promoting collaborative ventures, often linking them to the availability funding. For example the Tertiary Education Commission (TEC), which was established under the Education (Tertiary Reform) Amendment Act 2002, claims to:

“[take] an active role in facilitating collaboration and cooperation in the tertiary education system, and a greater system connectedness to wider New Zealand businesses, communities, iwi and enterprises.” [2]

The TEC is responsible for funding all post-compulsory education and training offered by universities, polytechnics and others. The six primary strategies of the Tertiary Education Strategy are to:

- *“Strengthen system capability and quality*
- *Te rautaki mātauranga Māori - Contribute to the achievement of Māori development aspirations*
- *Raise foundation skills so that all people can participate in our knowledge society*
- *Develop the skills New Zealanders need for our knowledge society*

- *Educate for Pacific peoples' development and success*
- *Strengthen research, knowledge creation and uptake for our knowledge society*" [2]

The changes required to meet these goals include "greater collaboration and rationalisation within the system". The TEC brought together a number of functional groups under a project called Collaborating for Efficiency. The report of the Library Services Sub-group [3] notes the high level of collaboration that already exists between libraries and makes recommendations for strengthening them. It is not surprising that the Library Services Sub-group has been one of the most successful. Libraries are based on the fundamental principle that 'if you share things you can have more of them'. We ask our users to share library resources with each other and we implement systems to share our resources with other libraries, both nationally and internationally. Collaboration should therefore come more easily to librarians than some professional groups. However the report recommended taking this further than has been the practice in the past. Included in its recommendations were:

"An Office of Library Co-operation to facilitate the scoping, development and implementation of practical collaborative initiatives designed to improve the performance of the tertiary and research library sector." [3, p.4]

A parallel initiative was a report commissioned by the Council of New Zealand University Librarians (CONZUL) and the New Zealand Vice-Chancellors' Committee (NZVCC). Helen Renwick, a former University Librarian at Massey University, was the consultant who undertook this project. "The Big Picture" report [4] looked at opportunities for closer collaboration among New Zealand university libraries. The goal of the "Big Picture" was:

"To maximise the benefit to tertiary education and research from the total investment in New Zealand university libraries through closer collaboration." [4, p.6]

It included a major section on the potential for a shared library management system. A specific recommendation was "that the university libraries implement common system software as the opportunities arise".

The benefits suggested [4, p.27] were that it would:

- Maximise interoperability between library systems
- Facilitate collaboration
- Minimise maintenance of interfaces
- Strengthen systems staff knowledge, encourage best use
- Assist service to users at other universities
- Promote unity
- Improve disaster recovery

Such an opportunity did arise in 2001 when five of the eight university members of CONZUL realised that they were all in the market for a new library system. CONZUL approved the CONZULSys Shared Systems Project with the final participation of Auckland University of Technology (AUT), the University of Otago, Victoria University of Wellington and the University of Waikato.

The possible inclusion of all or most of the university libraries at a later stage and a subsequent extension of the consortium to other tertiary and research libraries in

New Zealand was a future goal. The vision statement agreed to by the CONZULSys consortium was:

“To use and develop the best enabling technologies in a pioneering collaboration which will enhance the innovative delivery of library and information resources to the New Zealand tertiary learning and research community”

The consortium has successfully implemented the Information & Resource Access Management System (IRAMS), which is managed in a hosted environment by a commercial vendor. In order to create a governance structure that will allow for the inclusion of other institutions, it is about to establish a company, LCoNZ (Library Consortium of New Zealand), with the participating universities as shareholders.

The success of the CONZULSys consortium is being regarded as a model for other consortial activities. A capability study on the Next Generation Internet (NGI), which is seen as essential infrastructure for the knowledge economy in New Zealand, refers to CONZULSys as a model for collaborative development. A report from the Internet Society of New Zealand, with the intriguing title ‘Collaborating at speed’, has suggested that:

“The establishment of the CONZULSys Consortium, involving four Universities, and set up with the aim of acquiring a common shared library management system, is an excellent example of new “innovation economy” thinking. CONZULSys not only is a potential large user of a national NGI, but also provides a business model for collaborative activity. The NGI and CONZULSys initiatives should proceed in close consultation, preferably with shared governance infrastructure.” [5]

In another area, the Tertiary Education Commission is encouraging collaboration by providing funding to build capability in the areas of e-learning (e-Learning Collaborative Development Fund) and innovation (Innovation and Development Fund). CONZUL has participated in bids for these sources of funding, and succeeded with a proposal for the consortial purchasing of the core research electronic resources for all universities, three polytechnics and the Crown Research Institutes.

LIAC BEGINS ITS COLLABORATIVE JOURNEY

LIAC’s inaugural meeting took place in November 2003. It provided an opportunity for the Commissioners to get to know each other’s interests and priorities in order to be able to work together as a cohesive, functional group. Commissioners were also able to formally meet with the Minister and clarify her expectations of LIAC.

Its first task is to develop a work programme for the future. A facilitated planning day was held to develop a vision and begin scoping the work programme, for presentation to the Minister in April. In accordance with the National Library of New Zealand Act [6], the programme will be based on the provision of advice and reports to the Minister on the following matters:

- *“library and information issues in New Zealand, including mātauranga Māori, and access to library and information services*
- *the role of library and information services, including mātauranga Māori, in the cultural and economic life of New Zealand*
- *any other matters requested by the Minister.” [6, p.13]*

LIAC will be operating collaboratively at a number of levels. Apart from the requirement to do so, it is essential at a very practical level. LIAC is a group of six individuals, all with other heavy responsibilities, who will meet up to four times a year. It is clear that LIAC needs to be very focussed on what it can realistically achieve. Its primary responsibility is to advise the Minister, and through her, other members of government. This signals a strong advocacy role. Subsequent involvement in capacity building, specific projects and practical outcomes will be achieved only through collaboration with other organisations. These include:

- National Library of New Zealand Te Puna Mātauranga o Aotearoa. The National Librarian is an ex officio member of LIAC but LIAC's role is broader than the National Library
- The two professional bodies LIANZA (Library and Information Association of New Zealand Aotearoa: Te Rau Herenga o Aotearoa) and Te Rōpū Whakahau (Māori Library and Information Workers Association)
- Museums and archives - for example Te Papa (the national museum of New Zealand) and Archives New Zealand
- Other library and information bodies - for example those representing academic libraries, public libraries, special libraries
- Other government agencies - for example the Tertiary Education Commission, Ministry of Research, Science and Technology, Ministry of Economic Development
- International bodies – for example Museums, Libraries and Archives Council (UK), the World Summit on the Information Society (WSIS)

PARTNERSHIP AND THE TREATY OF WAITANGI

The Treaty of Waitangi, a document of great importance to New Zealand's cultural and constitutional identity, was a starting point for LIAC to begin examining its role. Auckland University of Technology (AUT), provides a helpful insight into the significance of the Treaty. Like other institutions in New Zealand, AUT recognises that one of its most important partnerships is with the indigenous Māori people of Aotearoa New Zealand. The AUT website [7] provides the following background:

“On February 6, 1840 New Zealand Aotearoa's founding document, The Treaty of Waitangi was signed. More than 500 chiefs of Māori tribes signed the Treaty. It is an agreement between the Māori people and the British Crown.

In this Treaty Māori ceded governance [kāwanatanga] to the British Crown, but were guaranteed full authority [te tino rangatiratanga] over their natural, physical and metaphysical resources. However, over the next 150 years the [principles] of the Treaty were breached. Only recently has the New Zealand Government and other organisations begun to commit to their obligations under the Treaty.”

As a first step in fulfilling its responsibilities with respect to mātauranga Māori (Māori knowledge), LIAC requested a paper as background to the Māori title of the Commission, Ngā Kaiwhakamārama i ngā Kohikohinga Kōrero. Māori is one of the two official languages in New Zealand and as Te Taura Whiri i te Reo Māori (the Māori Language Commission) explained:

“Māori is the foundation language of New Zealand, the ancestral language of the tangata whenua and one of the taonga guaranteed

protection under the Treaty of Waitangi. It also provides this country with a unique language identity in the rest of the world, as this is the only place where Māori is spoken widely.” [8]

The Māori name for the Commission, which had been suggested by Te Taura Whiri, is included in the National Library Act. Te Taura Whiri explained that the Māori title they chose has the broad, literal meaning of *“those who clarify or explain or advise on collections/collecting of information”*. This may be interpreted literally to mean all knowledge workers. However, idiomatically, together with the English name, the title means *“the advisers on the library and information sector”* or *“the official advisors on the library and information sector”*.

Understanding the origins of its name was important to LIAC. It recognised that if traditional Māori knowledge was not protected, preserved and promoted in Aotearoa New Zealand, where else could this be guaranteed.

In a parallel development the goals for LIAC are closely aligned with another exciting new development in Aotearoa New Zealand – the launch on 28 March 2004 of an indigenous free-to-air Māori language television station. The Māori Television Service Act 2003, requires the new channel to:

- *“Be a high quality, cost effective television provider which informs, educates and entertains*
- *Broadcast mainly in te reo Māori*
- *Have regard to the needs of children participating in immersion education and all people learning Māori.” [9]*

Māori television will have an enormous impact on promoting and preserving the Māori language (te reo). LIAC has a complementary role in advising on the preservation and protection of Māori knowledge (mātauranga Māori).

COLLABORATION WITH LIANZA

LIANZA (Library and Information Association of New Zealand Aotearoa Te Rau Herenga o Aotearoa) strongly supported the establishment of LIAC. At its second meeting LIAC met with the President and Vice President of LIANZA, for a briefing on the National Information Strategy. The strategy is supported by LIANZA’s treaty partner Te Rōpū Whakahaui and is defined as follows:

“A National Information Strategy addresses strategic issues to ensure that all citizens have the opportunity to access and utilise a nation’s knowledge wealth in a way that will enhance the social, political and economic well being of that country. It states government position on the creation, management and use of information, and sets direction for government action in support of the strategic goals.” [10, p. 10]

LIANZA emphasises the need for a national information strategy, in the current circumstances in which:

“New Zealand government currently has projects under way which are intended to optimise access to government services and information (e-government) and to help New Zealand business to use information technology to compete in the global economy (e-commerce) and address the digital divide for those communities who are well represented as being in it (connecting communities strategy.)” [10, p. 7]

The strategy takes a three pronged approach to knowledge, which it translates into a New Zealand context:

- *“Knowledge Access – Te Kete Tuātea – the infrastructure to access knowledge with (Telecommunication networks, libraries etc)*
- *Knowledge Content - Te Kete Aronui – the actual content be made available and accessible through an information infrastructure (Search tools & databases)*
- *Knowledge Equity – Te Kete Tuauri – the skills needed to turn information into knowledge; literacy, ICT (basic computing skills) and information literacy skills.”* [10, p. 4]

LIANZA has recommended that LIAC:

- adopt LIANZA’s vision for a national information strategy to help New Zealand achieve a knowledge based society
- develops this strategy further, using the resources available to LIAC
- recommends and promotes it to the appropriate channels
- considers and actions recommendations made by LIANZA’s sector groups

For its part LIAC acknowledges the considerable work that LIANZA has carried out and the consultation it has already undertaken with relevant sector groups. It sees parallels with the way that in the UK, the Chartered Institute of Library and Information Professionals (CILIP) has been working with the Museums Libraries and Archives Council (MLA) and the British Library on the Wider Information and Library Issues (WILIP) project [11]. The LIANZA briefing papers address similar areas of ‘capacity building’ and ‘libraries fit for purpose’ that have been identified in the WILIP project. LIAC is looking at ways in which it can use its advocacy role to turn the LIANZA recommendations into reality.

COLLABORATION WITH MUSEUMS AND ARCHIVES

Under the Act [6], LIAC is also required to promote collaboration between museums, libraries and archives. It has initiated this by meeting with Dr Seddon Bennington, Chief Executive of Te Papa, Te Taru White, Kaihautu of Te Papa and Dianne Macaskill, Chief Executive of Archives New Zealand. At this meeting it emerged that the National Library, Te Papa and Archives New Zealand were all developing the statements of intent (SOI) that are required of government departments. The SOI is intended to be a plain language story of what the department is expecting to achieve, how it will go about it and how it will measure progress. It signals a move away from a more mechanistic outputs approach. Sharing these statements was seen as a starting point for considering potential areas of collaboration.

COLLABORATION WITH THE NATIONAL LIBRARY

At each meeting the National Librarian has presented updates on strategic issues. The strategic areas of interest to LIAC include:

- the National Library’s Digital Strategy
- Digital Strategy Review paper currently being prepared by the Ministry of Economic Development for the Cabinet Policy Committee
- the Ministry of Education’s ICT Strategy
- E-learning strategies
- digital divide strategy

A National Library activity of considerable interest to LIAC has been its effective contribution to the World Summit for the Information Society (WSIS). New Zealand was the only country whose only official delegation was its National Library (although this delegation was supported by staff of other New Zealand government departments). This was particularly valuable as other library sectoral representatives, e.g. IFLA, had only NGO/observer status. Thus the National Library of New Zealand fulfilled a valuable role as an authoritative voice on issues of importance to the library and information sector. It was also able to highlight the considerable progress that New Zealand has already made towards information society goals. The Declaration of Principles and Plan of Action [12] from the WSIS are seen by LIAC as valuable documents for mapping the current and desired information landscape in New Zealand, using this to develop a gap analysis, for future action.

One of the most impressive achievements that will be mapped in this exercise is the recent initiative for the consortial purchasing of electronic resources for the whole country. Under the title EPIC (Electronic Purchasing in Collaboration), public, education, research and special libraries have agreed to jointly fund the purchase of tens of thousands of electronic resources. The Ministry of Education has also committed funding to extend this to every school in New Zealand. There have been similar examples internationally which were centrally funded but the collaborative nature of the EPIC project is both its point of difference and its strength. In a media release [13] to announce the successful outcome of this project, the National Library, LIANZA and LIAC were united in their assessment of its significance. From Penny Carnaby, CEO and National Librarian, came the comment:

"This collaborative venture also realises the vision of making information more easily available to a farmer in Southland, a student in Kerikeri, or a researcher in one of the large metropolitan areas," adds Ms Carnaby. "It's a great step for information democracy in this country." [13]

Mirla Edmundson, President of LIANZA, noted that:

"This is an amazing opportunity, and one that can truly impact on the lives of all New Zealanders. It puts the library and information sector on the map as innovative and enterprising, while demonstrating we are a profession interested in actively delivering information into the libraries, businesses, schools and homes of the country." [13]

And on behalf of LIAC I was delighted to acknowledge the vision of New Zealand librarians in bringing this project to a successful conclusion:

"The recent World Summit on the Information Society, held to address the issues raised by the rapid development of the global information society, adopted a declaration of principles and action plan for sharing information and knowledge. This is a wonderful example of these principles being put into practice, with New Zealand taking a significant role in turning the digital divide into digital opportunity for all." [13]

LIAC VISION

Clearly the task for LIAC, of developing a vision statement and work programme to present to the Minister responsible for the National Library, is occurring in an enthusiastic and energised environment. Building on the success of initiatives such as EPIC, LIAC has taken the idea of 'information democracy' expressed above by Penny Carnaby [13] and encapsulated it in the following vision:

Aotearoa – New Zealand: a leading information democracy

To achieve this vision there are a number of steps to be taken. The first is to map the existing information landscape, map information needs and analyse the gap. This will reveal **what is or isn't happening**. The next stage is to take an imaginative leap to determine **what could happen**. This stage is described as 'imagining the information society'. All this will take place under a policy arch of strategies and frameworks that are currently being developed. The policy arch describes **how it will happen**.

LIAC's role will be to connect to and influence the policy arch, and to oversee the 'mapping' and 'imagining' projects. Alongside this it has a role of 'informing' Aotearoa – New Zealand of the library and information issues that affect them.

The vision statement brings together three concepts - information, democracy and society – and is aligned with the LIANZA policy statement on Access to Information [14]. The policy statement begins:

"The Library and Information Association of New Zealand Aotearoa asserts that:

- 1. Free circulation of information safeguards our democratic society.*
- 2. The members of our society have a fundamental right of access to information."*

LIAC, with its advisory role to a Minister of government, can be a powerful advocate for that policy. The Minister has already expressed approval of LIAC directions.

CONCLUSIONS

Much of what LIAC has achieved in the few months since it was formed is more akin to the coordinating and cooperative stages of working together. However if a shared vision is one of the prerequisites for collaboration then an important start has been made, and the desire to move to a stronger collaborative level is already evident. In the promotion of collaboration LIAC is working in a broader context than just the library and information sector. For example, it is argued that the whole area of knowledge production (research) within the emerging knowledge society is changing from a disciplinary based model to what has been referred to as Mode 2 knowledge and Mode 2 society. Mode 1 knowledge is described by Gibbons et al [15] as being:

"generated within a disciplinary, primarily cognitive, context. Mode 2 knowledge is created in broader, transdisciplinary social and economic contexts." [15, p.1]

This transdisciplinary context is a driver for more effective collaboration and the breaking down of previously accepted boundaries. According to Gibbons et al:

"Mode 2 is more socially accountable and reflexive. It includes a wider, more temporary and heterogeneous set of practitioners, collaborating on a problem defined in a specific localised context." [15, p.3]

At the local level and from the perspective of a technology university library, this is a golden opportunity to contribute to the transformation to a knowledge society. Libraries, particularly digital libraries with large cross-disciplinary data sets, both create and encourage the breakdown of disciplinary boundaries. The digital resources of university libraries are a key factor in the success of e-learning. The ability to build digital libraries into the e-learning curriculum at the point at which it is designed (rather than supplying print resources at the consumer end of the

learning process) has the potential to fundamentally change the learning paradigm. With regard to Mode 2 research, technology universities also have a natural advantage, building on their applied traditions and social practicality. The concept of 'heterogeneous practitioners collaborating on a problem' is not an alien one and is the basis for the operation of many university technology parks. The development of an innovative Mode 2 knowledge society is dependent on new models for the social distribution of knowledge, and libraries are at the heart of these changes. EPIC is an example of a paradigm leap being made in the way that knowledge is being distributed.

At a national level, a small country such as New Zealand can also have a head start when it comes to implementing the required social change. The time has arrived for libraries to take a lead in the transformation to a knowledge society, and for LIAC to be a leading advocate for that change in Aotearoa – New Zealand.

REFERENCES

1. Hawkins, Brian. (2000), *Libraries, knowledge management, and higher education in an electronic environment*, [Online], Available from: <http://conferences.alia.org.au/alia2000/proceedings/brian.hawkins.html> [1 October 2003].
2. Tertiary Education Commission. *Who are we?*, [Online], Available from: http://www3.tec.govt.nz/about_tec/who_we_are.htm [23 April 2004].
3. Collaborating for efficiency: report of the Library Services Subgroup [Online], Available from: http://www3.tec.govt.nz/downloads/a2z_publications/cfelibrary_services_report.pdf [23 April 2004].
4. Renwick, Helen. (June 2002), *The Big Picture: Opportunities for potential areas for closer collaboration among the New Zealand university libraries: A report to CONZUL and the New Zealand Vice-Chancellors' Committee*, [Online], Available from: <http://www.conzul.ac.nz/BigPicture.pdf> [1 October 2003].
5. Internet Society of New Zealand. (2002), *Collaborating at speed: innovation infrastructure for a knowledge economy: a proposal to establish an advanced network for research, innovation and education in New Zealand*, [Online], Available from: <http://www.isocnz.org.nz/public/working-group-reports/wg-internet2/ngi020919executive-summary.html> [1 October 2003].
6. New Zealand Government, (2003), *National Library of New Zealand (Te Puna Mātauranga o Aotearoa) Act 2003*. [Online], Available from: <http://www.natlib.govt.nz/files/Act03-19.pdf> [23 April 2004].
7. Treaty of Waitangi. Auckland University of Technology, [Online], Available from: <http://www.aut.ac.nz/partners/treaty.shtml> [15 April 2004].
8. Te Karetu, T. & Waite, J. (1988), *Te Reo Māori*, [Online], Available from: http://www.tetaurawhiri.govt.nz/english/issues_e/reo/index.shtml [15 April 2004].
9. Māori Television, (2004), *Background*, [Online], Available from: <http://www.maoritelevision.com/corporate/home.htm> [23 April 2004].
10. *Towards a national information strategy*, (2002), LIANZA, [Online], Available from: http://www.lianza.org.nz/text_files/nis_7nov02.rtf [23 April 2004].
11. Howley, S. & Stevens, A. (2004), *Routes to knowledge, Update*, 3 (1), p. 38-39.
12. World Summit on the Information Society, (2004), *Declaration of principles and Plan of action*, [Online], Available from:

http://www.itu.int/wsis/documents/doc_multi.asp?lang=en&id=1161|1160 [23 April 2004].

13. *Libraries unite to strike digital gold for New Zealanders*, (2004), [Online], Available from: <http://www.natlib.govt.nz/bin/media/pr?item=1075147892> [16 April 2004].
14. LIANZA, (2002), *Access to information*, [Online], Available from: <http://www.lianza.org.nz/accesstoinfo.htm> [16 April 2004].
15. Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: the dynamics of science and research in contemporary societies*. London; Sage Publications.